



Operating Instructions

HEKA AUTO TEST SYSTEM

Univers UA2
H 2000



List of contents

Thank you and congratulations for purchase the HEKA test line.
Our aim is customer satisfaction. Please read the operating instruction.
We hope, you will have technical and economic success.
If you have any question please call HEKA hotline Tel.: +49-7 61-8 10 80.



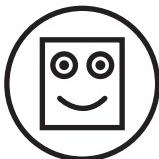
General

General	01
Safety in operation	01
Fabricator	01
Measuring system	01
Technical data's	01
Certifications	02
Maintenance	02
Guarantee	02



Using instruction

Quick use instruction	03
IR-Control	04
Toe, brake, suspension	05-06
Brake analyse	07
Toe test / analyse	08-09
Suspension test / analyse	10-11
Operation modes	12-13
Display indicating time	14
Visual defects	14
Weight input	14
PC-connection / function	15
Program options	16



Service

Trouble shooting	17
Date input	17
System Code	18
Initial Code	18
Service	19
Calibration	20



Placement / Installation

Transport, dimension, weight	21
Placement / Installation	21-27



General

At the HEKA test line you can test:

Alignment for front- and rear axle.

Results are in mm with +/- on the display, printed mm and 1/10 of mm.

Brake force for each wheel, difference at the axle, rolling resistance, ovality, and brake efficiency.

Suspension, numbers you get on the printout on the small printer.

Numbers and curves you get on the DIN A4 printer.

Numbers and curves you get on the PC screen and the printer.

The suspension test is a combination with the brake test.

The results will be collected during the brake test, at the same plates.

Safety in operation

HEKA test lines must be used only from trained people, with driving licence.

The area behind the test line must be free of people.

The brake pedal must be checked, if it's not too low by pushing hard, before each test!

The test speed is minimum 5 km/h till maximum 10 km/h.

HEKA test lines can be installed in areas where people walk.

A safety plate should be installed, if the area are often used by people.

Fabricator

HEKA AUTO TEST GmbH, Tel.: +49-761-81080

Ensisheimer Str, 4 Fax: +49-761-81089

79110 Freiburg,

Germany

Measuring system

The test plates for brakes and suspension are at ball bearings. A mechanical free play is given and adjustable of 1/10 mm - 2/10 mm.

DMS sensors (amplifiers integrated) measure the force (in test direction) and transmit the signals to the CPU, in the electronic box.

The alignment test works with two plates. One plate is fixed. One plate is moving left and right. The toe results are measured by potentiometer.

All zero points are automatically adjusted (each 10 seconds).

Microprocessor works with Software, analysed and calculated all data's.

At the big display results are indicated. Via print signal the data's will be sent to printer and to the RS 232 for PC.

Technical data's

Display dimension b 710 mm x h 820 mm x d 40 mm UA2

Display readability distance 25 m minimum

Digital numbers 90 mm h

Ground segment l 2900 mm x b 600 mm x h 40 mm.

Max brake power 10.000 N

Max axle load 4 to standard, 5 to. loaded

Electricity U 100 – 240 VAC, 50/60 Hz

Max. 50 W, I max 1,2 A



Certifications

HEKA test lines are certificated in different countries for the officials test.

So in Germany by the RW TÜV Essen.

HEKA is certified also for security by GS Hannover.

HEKA products are manufactured by the norm ISO 9001 TÜV-CERT.

Approved for:

Passenger cars and light trucks

Four wheel drive, permanent 4x4

ABS systems

Tuned cars with spoiler

Trailer one axle and tandem axle

Motorbikes

Tractors

Maintenance

Twice in the year, spring and autumn should the plates for brake and alignment, be discovered.

Cleaning water drains and check the ball bearings. Caution not remove the black special crease from the balls.

To the place for the balls, give fresh crease.

The frames should be coated with care wax.

The mechanical free play, for the frames must be adjusted to 0,2 mm in test direction.

Please clean and protect the cover plates, on upper and lower side, with light car wax.

The test line, will thank you, with long and trouble free life.

Guarantee

HEKA factory guarantee for test line, under normal using.

HEKA allows 3 years guarantee, for all parts, from the date of leaving the factory.

Caution, there is no guarantee:

1. If lightning destroy electronic parts, sensors and so on.
Please insurance against this risk, for any customer!
2. If water drains closed.
3. If welding works (electric) are done, at parts, near or connected with the test line!



Quick use instruction

The HEKA test line shall be always switched ON.

Display	KEY	Function
---------	-----	----------

Operation modes

0000 gr.0000		Brake plates are ready for test	(manual operation)
E000 gr.0000		"	(manual by one key)
A000 gr.0000		"	(semi-automatic operat.)
A000 gr.0000		"	(full-automatic operate.)
gr. 0		Toe plates are ready for test	

Change operating mode (manual, manual one key, semi-automatic, full-automat.)
push "9", "Green", "SCR", per "SCR" you can choose, confirm by "Red".

Test result storing (manual). Start test if system is ready for and wait for indicating:

1280 gr.1310	push "1"	Storing brake results for front axle
0840 gr.0780	push "2"	Storing brake results for rear axle
1030 gr.1060	push "3"	Storing brake results for hand brake
+ gr. 1	push "5"	Storing toe result for front axle
+ gr. 3	push "6"	Storing toe result for rear axle

Note! The results can be stored, if the coloured result lights are flashing.

||||||| ||||| Display reads if data's already exists.

Display indicating time

Display indicating time Results can be stored only in the indicating time.

If indicating is over, you get last results again by "8".

Change indicating time

push "9", "Green", "4", than you see the time. Change the time by "4".

If you have the requested time, confirm by "Red".

Visual defects

Visual defects push "MENU" Now you can input the number for the visual defect.

Each number shall be confirmed by "Red".

Weight input

Weight input push "7"

Than you push "6" for each 10 kg

"8" for each 100 kg

and "5" for each 1000 kg, confirm by "7".

Note. You can input weight always, but before print.

If you give the weight into, than you get efficiency for foot- and hand brake.

Toe tolerance

Toe tolerance push "Green" Now you give the number for the requested tolerance.

See toe list and choose, confirm by "Red".



13.07.2000

PRINT SCROLL MENU CLR

+ - , ← →



- a. Store delete, paper and ready for new test.
- b. Confirmation for inputs only without weight.

Visual defects input

Print x 1

Print x 2

ABC DEF GHI JKL



Ready for new test (no delete)

Hand brake store

Rear brake store

Front brake store

MNO PQR STU VWX



Last indicated results again on displ.
Weight input 100kg

Weight input key an confirmation

Rear toe result store
Weight input 10kg

Front toe result store
Weight input 100kg



Last stored results 1, 2 3 5 6

Toe tolerance 1-9 extra functions

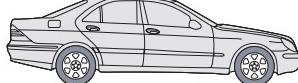
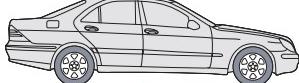
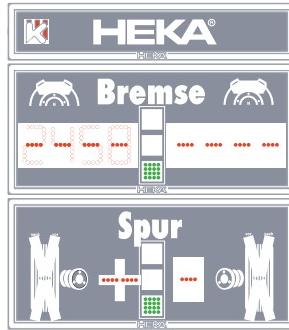
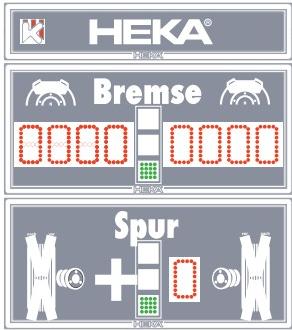


Ready for test

1. Test front axle
• Toe and Brake

Store front
Toe and Brake

Toe front store
Key "5"

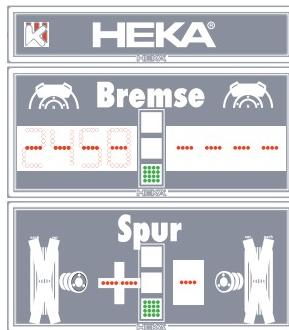
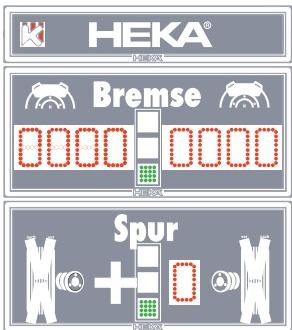


Ready for test

2. Test rear axle
• Toe and Brake

Store rear
Toe and Brake

Toe rear store
Key "6"

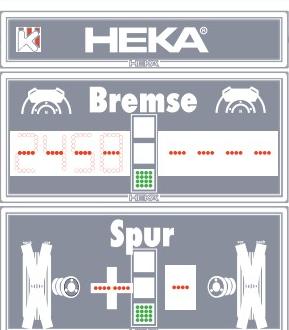
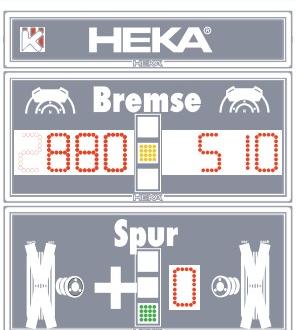
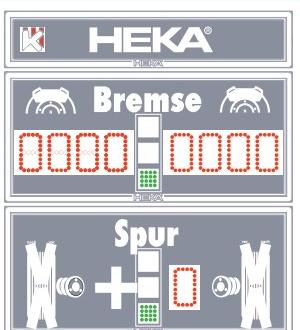


Ready for test

3. Test
• Hand brake

Store
Hand brake

Hand brake stor
Key "3"





Using instruction

0000 gr. 0000 Brake display shows zero and green light on = Ready to test
gr. 0 Toe display shows zero and green light alight = Ready to test.
Each display shows separately if it is ready for the next test.

Storing of the results are only possible, if they are indicated.
After the indicating time you can not store.
If the indicating time is over you get last results again by Key "8".
Than you can store.

Test result storing (manual). Start test if system is ready for and wait for indicating:

1280 gr.1310	push "1"	Storing brake results for front axle
0840 gr.0780	push "2"	Storing brake results for rear axle
1030 gr.1060	push "3"	Storing brake results for hand brake
+ gr. 1	push "5"	Storing toe result for front axle
+ gr. 3	push "6"	Storing toe result for rear axle

Note! The results can be stored, if the coloured result lights are flashing.

**If Brake display shows ready for test and
If toe display shows ready for test, than start with test:
Front axle**

Drive vehicle from at least 3 m distance at 5 - 8 km/h.

A straight approach is important.

Before reaching the plates put gear in neutral.

Do not influence steering.

Pass toe plate, when you reach brake plate, brake smoothly till stop.

After coming to stop hold brake pedal for another 2 seconds (suspension).

Wait for the results and the green, amber or red light blinking, than store!

Check that you not touched with rear axle the toe plate!

Rear axle

If displays showing ready, start from your position again.

Pass toe plate, when you reach brake plate, brake smoothly till stop and hold pedal for 2 seconds. Store results.

Hand brake

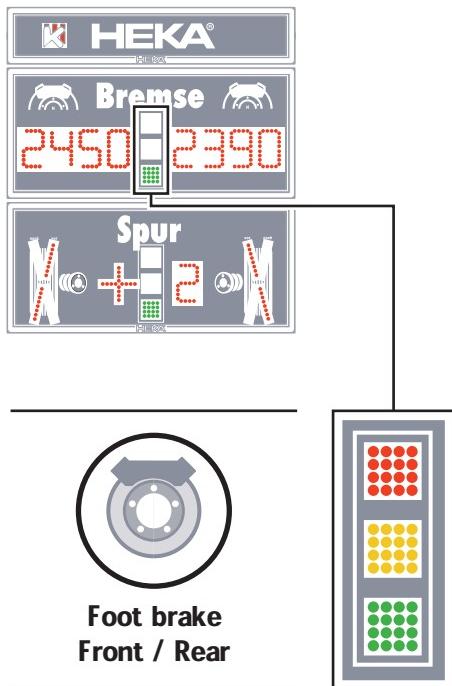
You can start if you stopped on the first half of the sensor plates, in the other case set back on the sensor plate to the beginning of brake plate.

Start from this position and stop with handbrake smoothly with holding 2 seconds more.

You use the speed (5 - 8 km/h) and speed is energy.

The energy for brake test is big enough in this procedure and real much bigger than you have at an roller test stand.

See and compare results at front brake and hand brake, for example!



The coloured lights showing the difference of the maximum brake power left and right, at one axle.

Colour	Difference printed	Analyse
Red	25 - xx	Not OK.
Yellow	21 - 24	OK.
Green	0 - 20	OK.



Red	50 - xx	Not OK.
Yellow	41 - 49	OK.
Green	0 - 40	OK.



Toe tolerance

Toe tolerance push "Green" Now you give the number for the requested tolerance.
See toe list and choose, confirm by "Red".

Toe tolerance list

There are 8 fixed tolerances for TOE in the test line:

0	=	No tolerance limit		
1	=	-1 mm	to	+1 mm
2	=	-1 mm	to	+2 mm
3	=	+1 mm	to	+3 mm
4	=	+2 mm	to	+4 mm
5	=	-2 mm	to	+1 mm
6	=	-1 mm	to	-3 mm
7	=	-1 mm	to	-4 mm
8	=	-2 mm	to	-6 mm

Input fixed toe tolerance:

Key "GREEN" than number for tolerance 1 ... 8
Confirmation by "RED".

Input free toe tolerance:

Key "GREEN" + "GREEN" now,
you see left at brake display the lower toe limit and right the upper limit in mm.
The cursor is flashing, left for "-" or "+", for the symbol "+" it is dark.
"-" or "+", you can change by any number, from 0 to 9.

Each given number let the cursor go one step to the right, and the number is registered.
If you want to push the cursor to the right, without change,
than use key "GREEN", for each position.

If the free tolerance limit is ok, than confirm, at any position of the cursor, by "Red".

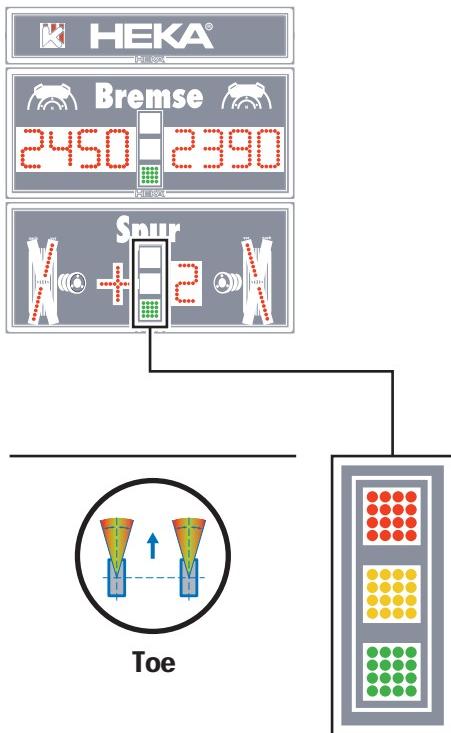
Toe test:

If a result is within the tolerance, than you get green light at the display and on the print out is "Toe OK".

If there are 0,9 mm plus ore minus tolerance, you get yellow light.

If there are more than 0,9 mm plus ore minus than you get red light and on the print out is "Toe not OK".

You can store, front toe and rear toe, for print out and PC.
But the tolerances are only for front toe!



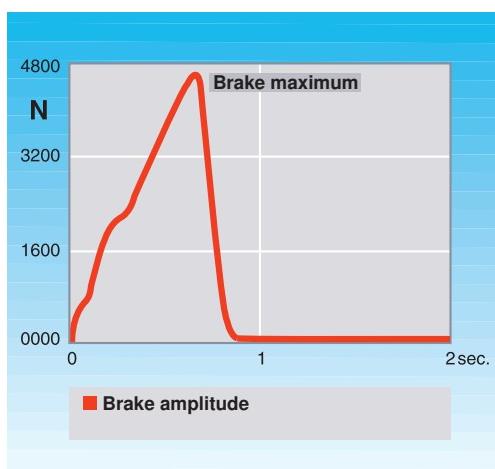
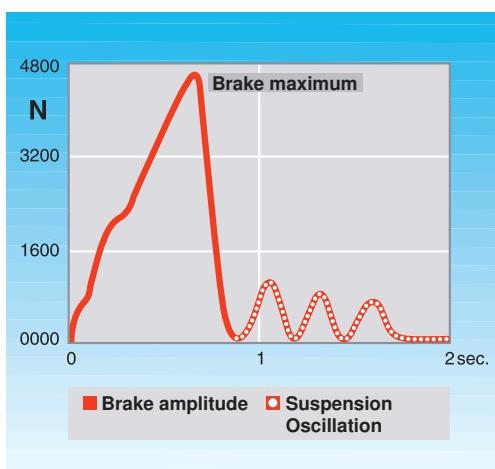
The coloured lights gives fast information about correct adjustment.

Colour	Tolerance	Analyse printed
Red	> 0,9 mm	Not OK.
Yellow	+/- < 0,9 mm	OK.
Green	within	OK.



At the HEKA Test Line, you can collect and analyse the dynamic oscillation after braking. The result give information about the shock condition.

To get the dynamic oscillation after brake, it is requested to hold the brake pedal, or hand brake lever, 2 seconds after stop.

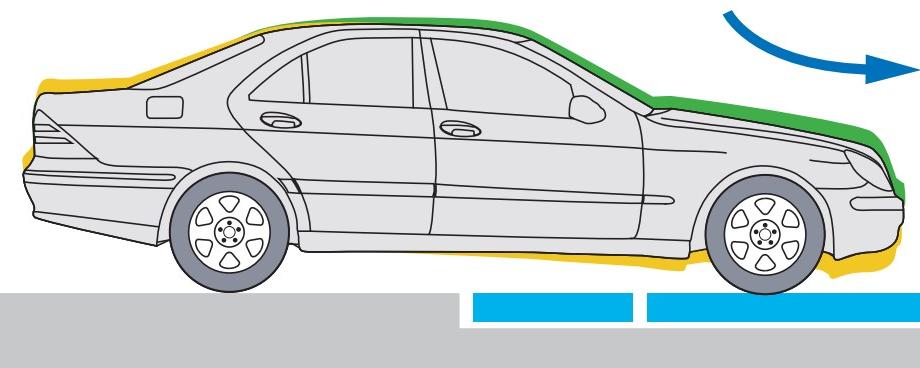


Test procedure OK

Brake pedal, hand brake lever was hold 2 seconds.

Test procedure Not OK

Brake pedal, hand brake lever was not hold and for that no results!



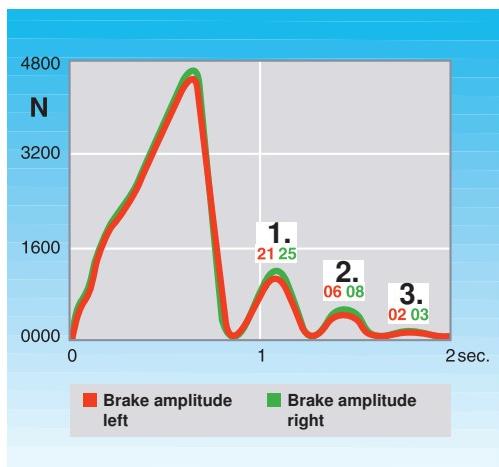


Three results will be printed:

1. Oscillation after front brake
2. Oscillation after rear brake
3. Oscillation after hand brake

Each of these results are three amplitudes.

For example: Oscillation front brake



Left	Amplitude	Right
21	1.	25
06	2.	08
02	3.	03

The height of the amplitude is given than a relative number.

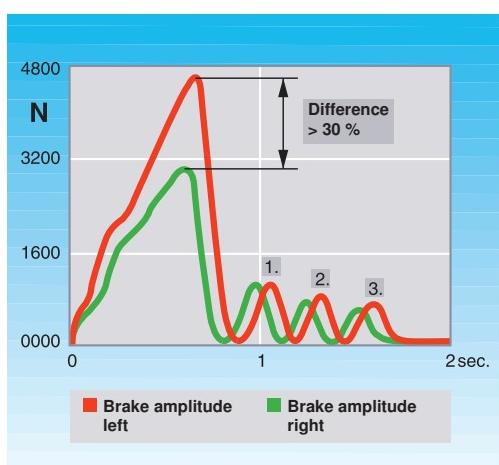
It should be: the first amplitude the highest,
the second lower
the third nearly to zero.

As lower the amplitudes are, as better the shock condition.

Left and right should nearly even in the 10 range.

The results with old and new shocks will give you the best experience!

Bad brakes = bad oscillation



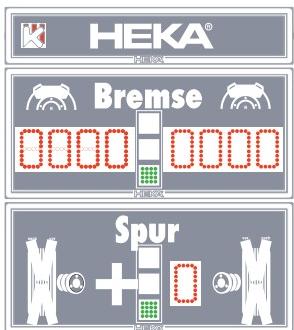
If the brake difference on one axle is bigger than 30%, so you get no results!
On the print you get "XX".



You can choose operation modes:

Manual operation

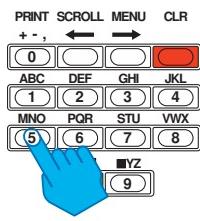
Test steps by IR-Control manual



One key operation

Store by key "5" all test steps.
Sequence is:

1. Front toe and brake
2. Rear toe and brake
3. Hand brake

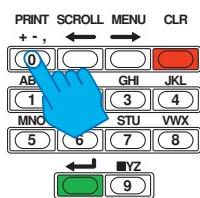


Semi automatic

Store automatic
Print signal via IR control

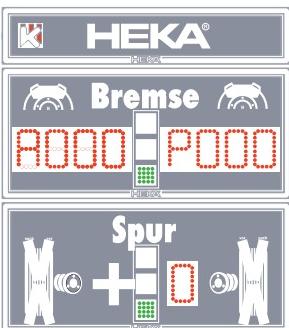
Sequence is:

1. Front toe and brake
2. Rear toe and brake
3. Hand brake





Full automatic



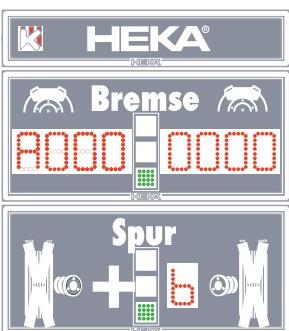
Store and print is automatic

No IR-Control used

Sequence is:

1. Front toe and brake
2. Rear toe and brake
3. Hand brake

Change operation mode

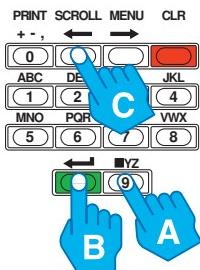


You can change the operation mode as follows:

Key "9" , "←" , "Scroll".

Now you use key "Scroll" for change.

If you get your requested mode, confirm by "CLR".





Display indicating time

Any measuring will be shown on the display.
If there are any indicating, this will be as long as:
1. the indicating time is chosen, or
2. indicated results will be stored.

In that case, you would like store results, but the indicating time is over and you see zero.

You can store results only, if they indicated on display!
By key "8" you get the result again to the display and then you can store.

Change indicating time

push "9", "Green", "4", than you see the time. Change the time by "4".
If you have the requested time on the display,
than you can confirm by "Red".

Visual defects

Visual defects push "MENU" Now you can input the number for the visual defect.
Each number shall be confirmed by "Red".

There are 8 defects visible, you can choose by IR control:

- | | |
|-----------------------|-----------------------------|
| Key "MENU" and number | 1. Brake - linings |
| | 2. Brake mechanism |
| | 3. Brake - tubes |
| | 4. Brake system defect |
| | 5. Shocks front oil loosing |
| | 6. Shocks front loose |
| | 7. Shocks rear oil loosing |
| | 8. Shocks rear loose |

Input of any visible defect brake, will change the brake result at print,
always to "Brake not ok!"

Input defect shocks gives at print out always "Shocks are not ok!"

Weight input

It will taken normally the maximum weight of the car.

This weight will given via IR control to the test line.

You can input to any time, in the beginning of the test
or at the end, but you must do it, before you give signal for print!

Weight input push "7" Then you push "6" for each 10 kg
"8" for each 100 kg
and "5" for each 1000 kg, confirm by "7".

On the print out, you get the weight of the car,
the efficiency foot brake and the efficiency hand brake,
each in % deceleration.

There will be automatically compared the efficiency
asked from the officials in the country.

Only when you give the weight into, you get efficiency for foot- and hand brake!

**PC - connection and function**

After installation at a PC, connect the test line from RS 232 to COM 2 at the PC via PC – cable.

See disk.

Function is ok, if you get the display at the screen with all indications.

If a car test is completed, than you give the signal PRINT.

Now, on the screen, you get curve-results for front and rear brake in one display.

You can choose via: F7 = curves or columns

What is shown, you can print via F 10

The print gives always the numbers of test result and graphics, what you have chosen at the screen.

For analyse the results use F1 = numeric results

F2 = brake front

F3 = brake rear

F4 = hand brake

F5 = toe

F7 = graphic curves front + rear

F7 = graphic columns front + rear

F7 = graphic curves

Caution! F8 = only for change name/car no.

F9 = store of the test results,

please input name/car no.

F10 = print

You print these, what you have on the screen.



Program options

Start all options per key

"9" + "SCROLL" ...

Printer DIN A 4 type choose per key

"PRINT" = P 0 - all txt printer
 "PRINT" = P 1 - graphic, 9 pin b/w
 "PRINT" = P 2 - graphic, 9 pin colour
 "PRINT" = P 3 - graphic, 24 pin b/w
 "PRINT" = P 4 - graphic, 24 pin colour

If you have the correct printer

confirm by "Red - CLR".

Caution: EPSON printer working with P3 b/w and P4 colour!

Printer function via adapter, connected at socket "printer".

Printer, no function? At display = pap out means:

1. no paper
2. printer not connected
3. printer not on

At display = Err 13 means:

1. paper trouble
2. other problem /not ready

Start all options per key

"9" + "SCROLL" ...

Toe type choose per key

"MENU" C 0 = only 9 / 1 = 1-8

Speed on / off

"1" Pb5 0 = off / A5 = on

Shock test on / off

"2" P70 0 = off / A5 = on

Measuring time in seconds

"3" Pb4 0 = 3 sec. / A5 = 2 sec.

Hand brake test

at the 1. or 2. plate set, only UA4 "4" P87 0 = 2. pl. / A5 = 1. pl.

Extra program

"5" P9d 0 = off / A5 = on

Toe factor

"6" Pb5 0 = 1,0 / A5 = 0,7 mm

Brake relation front/rear print out

"7" P9b 0 = off / A5 = on

Pedal force measuring, pedal unit

"8" P79 0 = off / A5 = on

Brake rear, higher sensibility

"9" P67 0 = off / A5 = on

Motorcycle test configuration

"Green" Pb6 0 = off / A5 = on

For all options confirmation is always "Red - CLR".

Car types choose per key

"9" + "GREEN" + "MENU"

Forward per key "MENU" ...

AAA = passenger car

LLL = lorry (max 4 to per axle)

t t t = tractor

Mot cyc = motorcycle, choose left / right

Confirmation by key "Red - CLR".

Test number input

You can input a number for each test, before print via "GREEN" + "MENU"

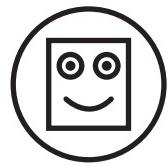
C 0 0 0 0

Scroll with the keys

"1" "2" "3", confirm "Red-CLR"

Statistic print

You get a statistic print out, for all tested cars before, "9" + "GREEN" + "PRINT".



Trouble Shooting

Display	Problem	What to do
Err 10	No zero point	Go to service mode, via key "GREEN" + "MENU" + "9" + "PRINT" + "SCROLL" + "1" = brake zero points "UA2"
28 228 or 28 0		Zero point left is ok., zero point right is not ok. Control cable? If destroyed? Renew cable.
SE 00 SE00	blinking Date is wrong	If cable ok, renew brake sensor right. Tests are possible, but you need an actual System code.
SE00 SE00	steady	No test possible, you need an actual System Code. See System code... If you have, after input new System code, the same reading (SEO), you need Initial code. See Initial code. Caution, you must input the correct date.

After repair make a new start. Turn off the test line and turn on again.

PRINT OUT, FOR TROUBLE SHOOTING!

A printout for searching troubles can be made, by keys "9" + "GREEN" + "GREEN".
If the hot line HEKA Freiburg get this by fax, we can help.

Date input

Actual Date

Ask for the actual Date via "Enter GREEN", "SCROLL" = month year per "CLR - RED" leaving.

If the date is in the past, adjust to actual.

If the date is in the future, there is no possibility to adjust back. You need Initial code.

The test line has a Date-Limit, for service reason!

Latest after two years, the unit must be inspected for exactness.

Ask for the Date-Limit via "Enter green", "SCROLL", "MENU" = month year, if you near to this Date, ask for service with a new System Code!
Per "CLR red" leaving to test mode.

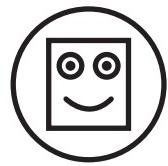
Adjust Date

"Enter GREEN" + "SCROLL", you see the Date in the unit, and now you can change it as follows:

Display reads no for
scrolling per key

D	D	M	M	Y	Y
"1"	"2"	"3"	"4"	"5"	"6"

If you have the correct Date at the display, confirm by "CLR RED".
(D means day, M means month, Y means year)

**SYSTEM - CODE**

You get the SYSTEM-CODE from HEKA Freiburg by Fax, for that we need the Unit No. - - - .

System code input

"Enter GREEN" + "SCROLL" + "MENU" (light red) + "MENU" (light green), now ready for input System code, as follows:

Display reads sign scrolling per key	0 0 0 "1" "2" "3"	0 0 0 "4" "5" "6"
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If you have the correct System code at the display, confirm by " CLR RED".

After input System code, check the actual Date!

INITIAL - CODE

You get the Initial code from HEKA Freiburg by Fax, for that we need the Unit No. - - - .

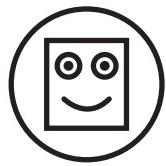
Initial code input

"Enter GREEN" + "SCROLL" + " 9" (light yellow), now ready for input Initial code, as follows:

Display reads sign scrolling per key	0 0 0 "1" "2" "3"	0 0 0 "4" "5" "6"
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If you have the correct Initial code at the display, confirm by 2 x "CLR RED".

After input the Initial code, check the actual Date!


Service

Best, once a year, but latest after two years, the test line must have a maintenance.

See Maintenance, page 02, after maintenance check zero points.

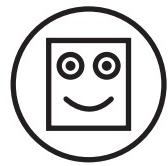
Check zero points first, for brake = 28
for toe = 128

Service function

Use keys as follows: Display

"Enter GREEN"	C--	- -0
+ "MENU"	CHE	000
+ "9"	SSS	SSS (about 2 seconds)
+ "0"	0000 Red	0000 Brake, Newton indicated, UA2, or 2. plate set, if UA4!
+ "SCROLL"	0000 Yellow	0000 Brake, Newton indicated, 1. plate set, only UA4!
+ "1"	28 Red	28 Brake, Zero point, UA2, 2. plate set, if UA4!
+ "2"	28 Yellow	28 Brake, Zero point, 1. plate set, only UA4!
+ "5" ("6")	Green	128 Toe, Zero point
+ "8"	255	000 Configuration, ca. 4 seconds
+ "MENU"		123 Unit no. ca. 2 seconds

"CLR RED" for confirmation and restart.



Calibration

Once a year, but latest after two years, the test line should be calibrated!

For calibration you must use the original HEKA calibration set.

1. Set Calibration tool in position,
2. go to brake Newton indication, see above service function.
3. Give power 1000 kg with the calibration tool set,
the indication should be 980 Newton.
4. Realise the deviation in %
5. Release the power from the calibration tool set.
6. This procedure left and than right.
7. Leave the service function, "CLR RED". After correction, procedure again.

Calibration correction

For correction the calibration, there are multiplication factors.

The indication for the factor is 100 and means, that the result will multiplied by 1,00.

You get these factors via keys:

"9" + "MENU"	100 Red	Brake left, factor, UA2 or 2. plate set, if UA4!
"2"	Red 100	Brake right, factor, UA2 Or 2. plate set, if UA4!
"3"	100 Red	Brake left, factor, 1. plate set, only UA4!
"4"	Red 100	Brake right, factor, 1. plate set, only UA4!

Via key "1" you get again the factor for Brake left UA2.

Caution, "1" and "2" are the brake factors left and right, for the test line UA2.
Only UA4, there is 1. plate set and 2. plate! That means, in test direction.

Correction a factor,

use key "**GREEN**" for up, 1,01 - 1,02 - 1,03 ...

Use key "**9**" for down, 0,99 - 0,98 - 0,97 ...

Use key "**8**" for set back to 1,00.

End of calibration and **confirmation by "Red CLR"**.

Control print out for calibration factors, per "9" + "GREEN" + "GREEN" (long).

**Transport, dimension, weight**

HEKA test lines are packed in one original case 187 cm x 77 cm x 65 cm

Weight, "UNIVERS A2" Gross weight = 350 kg, Net weight = 317 kg.

This case is used one way. Please keep away from wet.

Placement / installation

HEKA test line must have a special place. Any car can and should be tested.
For the HEKA check you need only seconds. The economic possibilities are enormous.

In the entrance to the garage or station and an reception area is ideal.

Space needed

Before the HEKA test line 5 m straight and behind an free security area of 5m is requested.
Left and right of the test line minimum 0,5 m space must be planned.

Requirements to the place of installation

Installation outside or inside is possible. All temperatures and all humidity are accepted.

But the Display must be protected against rain and sun!

The place should have a maximum descent gradient of 1%
(1cm height difference of 1m).

3m before and 3m behind, there shall be no obstacle higher than 1,5 cm.

For exact results(specially toe), installation even with floor is recommended.

Energy, electrical connections and drains

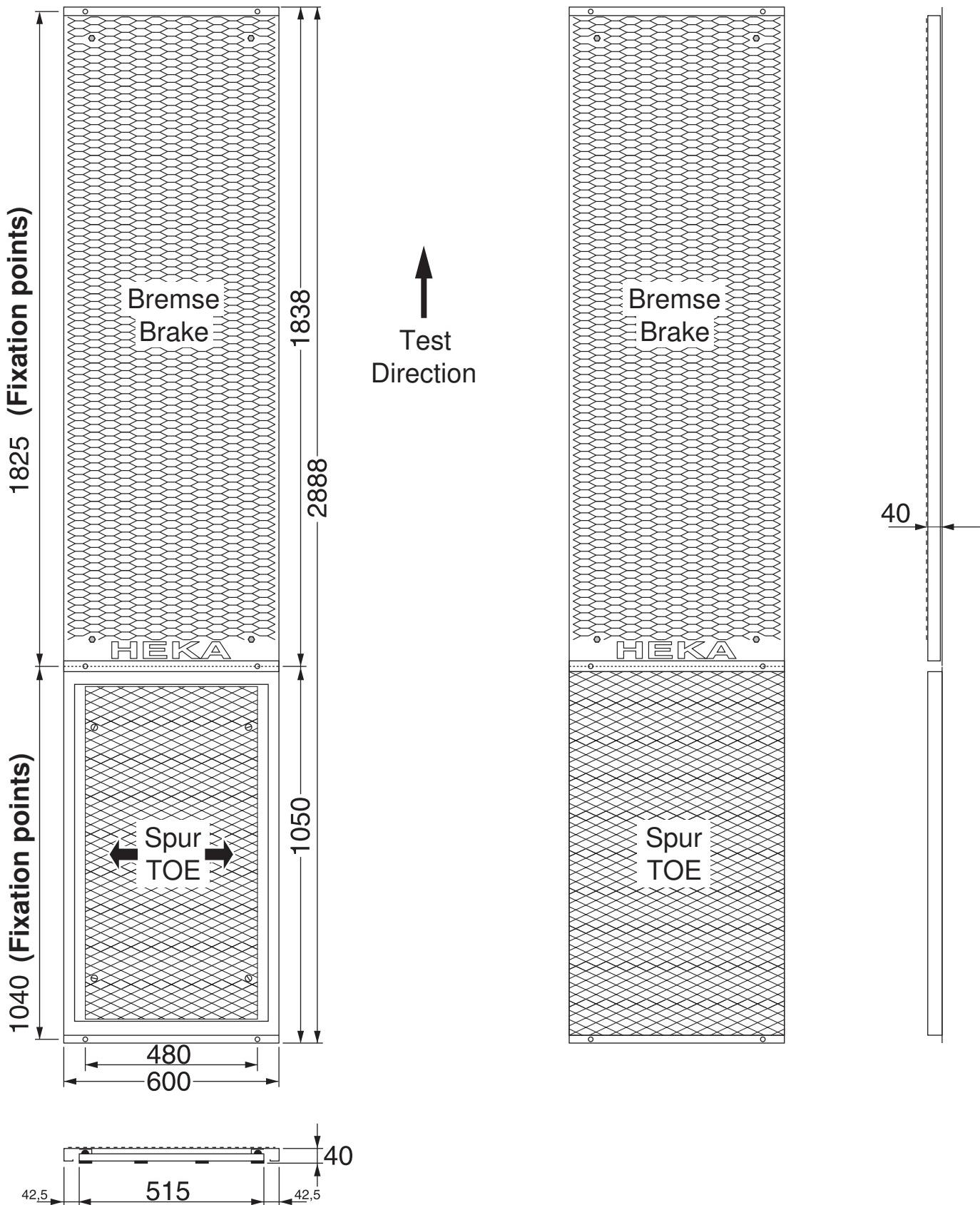
See 1.3.electricity. It is recommended to have an extra switch for electric power.

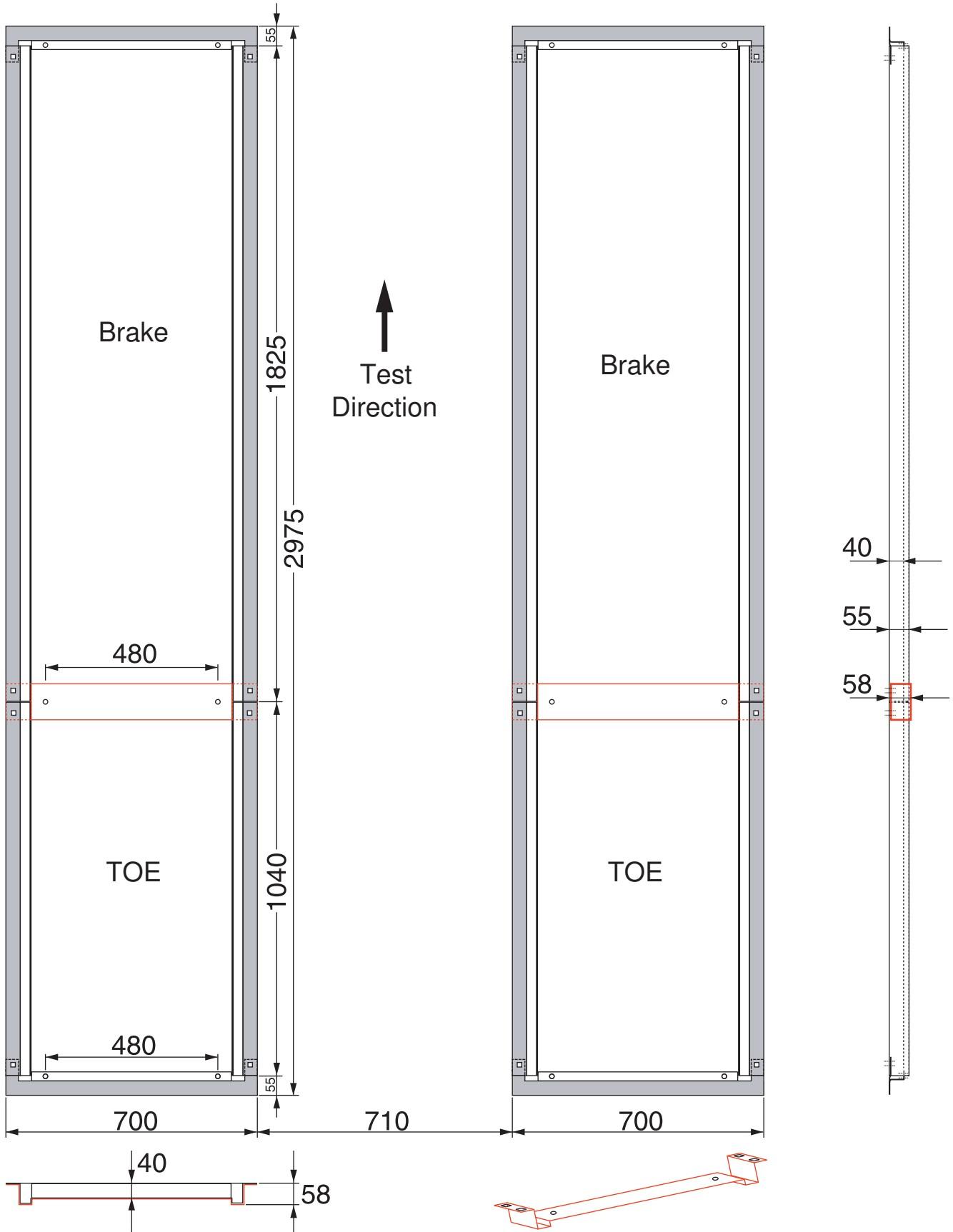
The ground unit must be connected by earth.

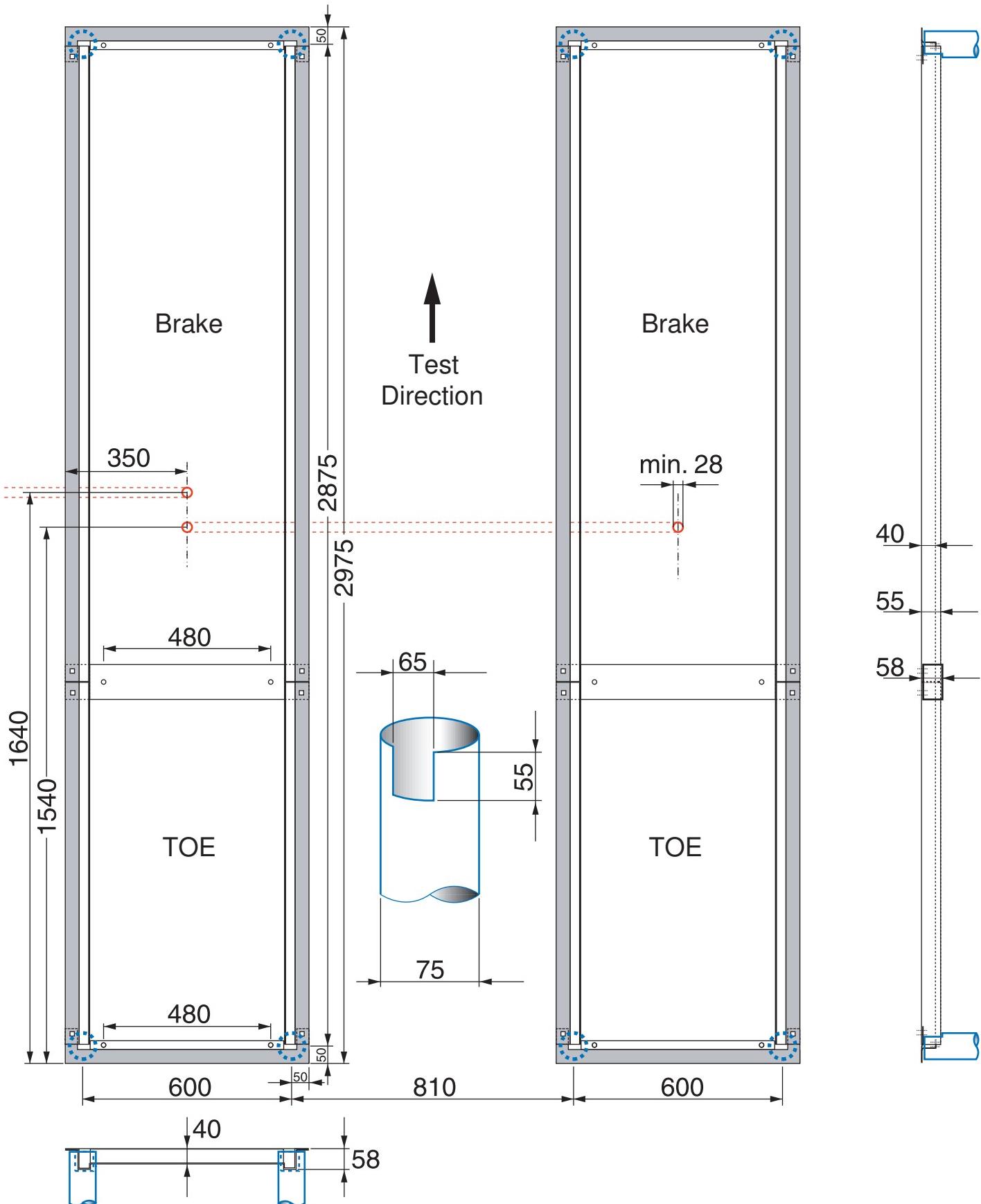
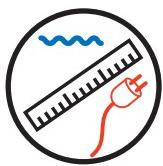
Installation even with ground, needs big enough water drain, see also plan.

The display can hang up under the ceiling or the wall in a good visible distance.

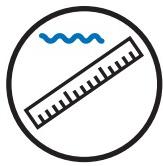
See also plan No. 22 – 27.



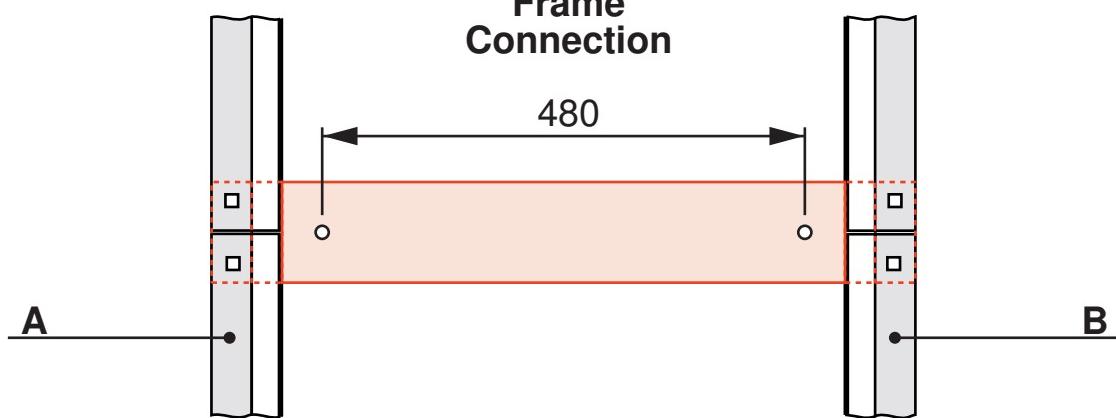




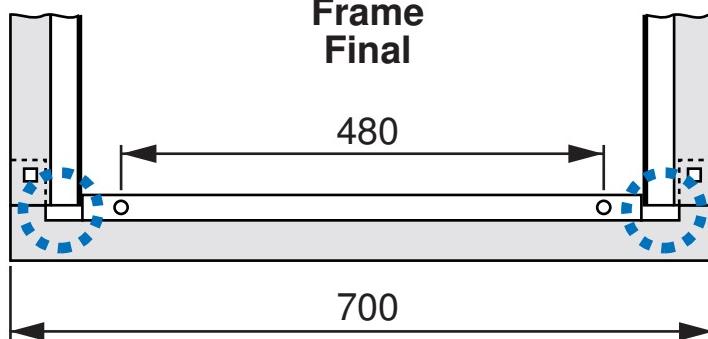
13.07.2000



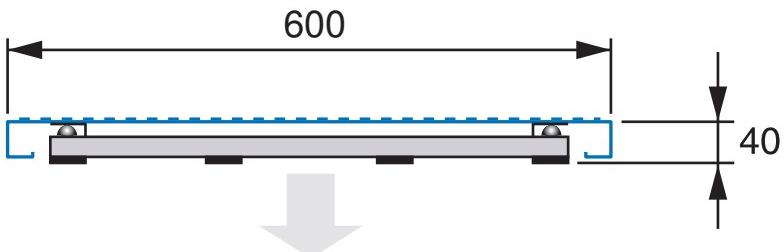
Frame Connection



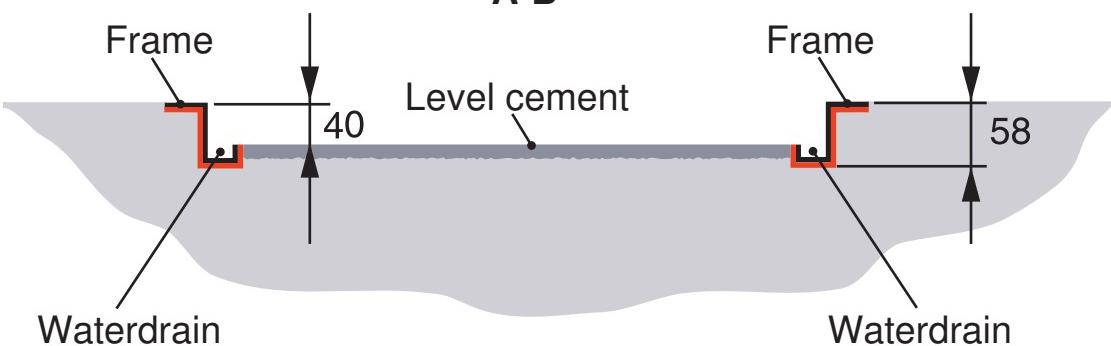
Frame Final

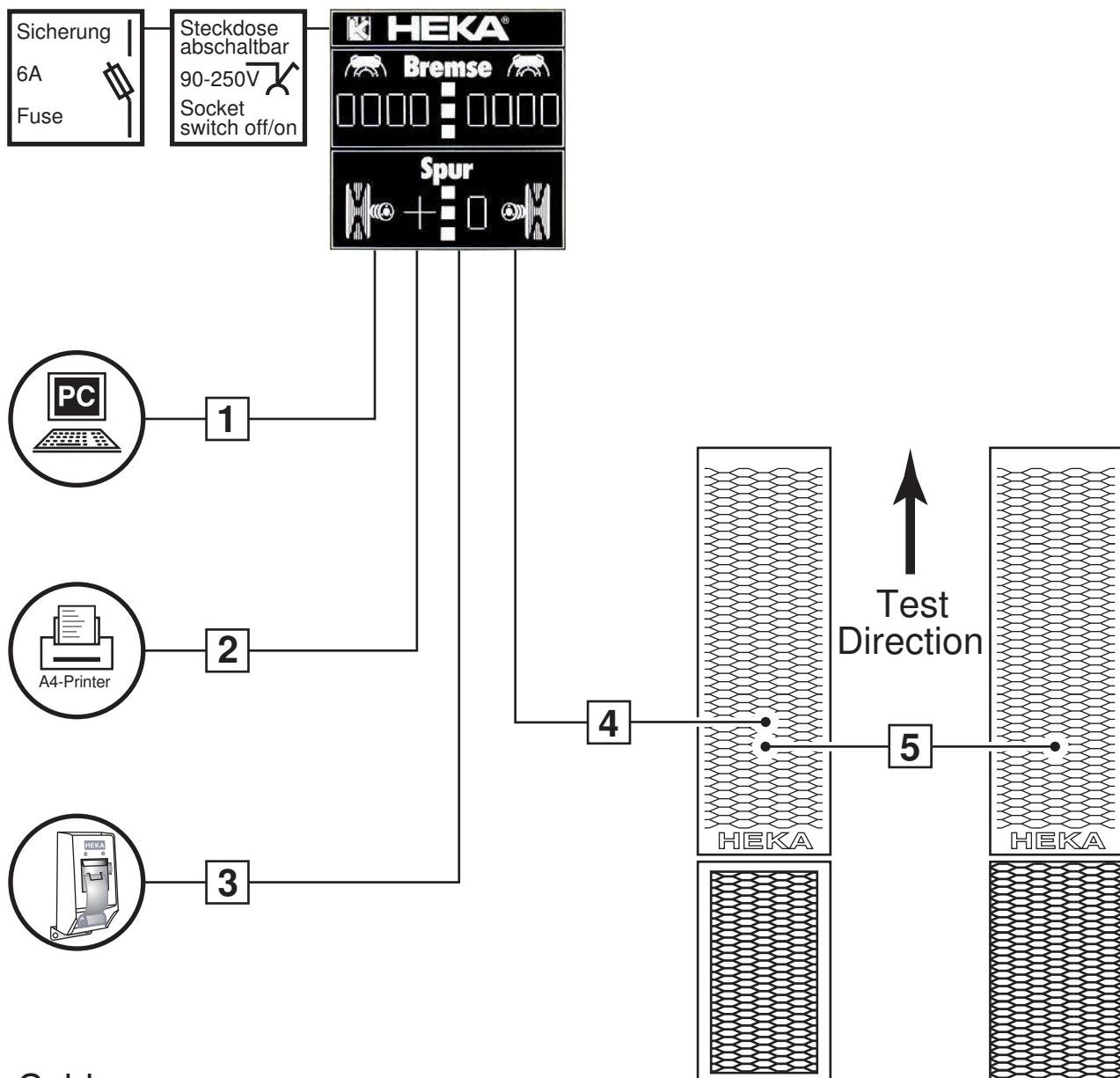


Test-System



A-B





Cable

No.	Description	Length (m)
1	PC Computer	<input type="checkbox"/> 10 <input type="checkbox"/> 15 <input type="checkbox"/> 20 <input type="checkbox"/> 30
2	A4 Printer	<input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> 17 <input type="checkbox"/> 24
3	HEKA - Printer 24V	<input type="checkbox"/> 3 <input type="checkbox"/> 6 <input type="checkbox"/> 12 <input type="checkbox"/> 20
4	Hauptkabel / Mains cable 12V	<input type="checkbox"/> 15 <input type="checkbox"/> 20 <input type="checkbox"/> 25 <input type="checkbox"/> 30
5	Zwischenkabel / Connection	<input type="checkbox"/> 3,5 <input type="checkbox"/> -----

